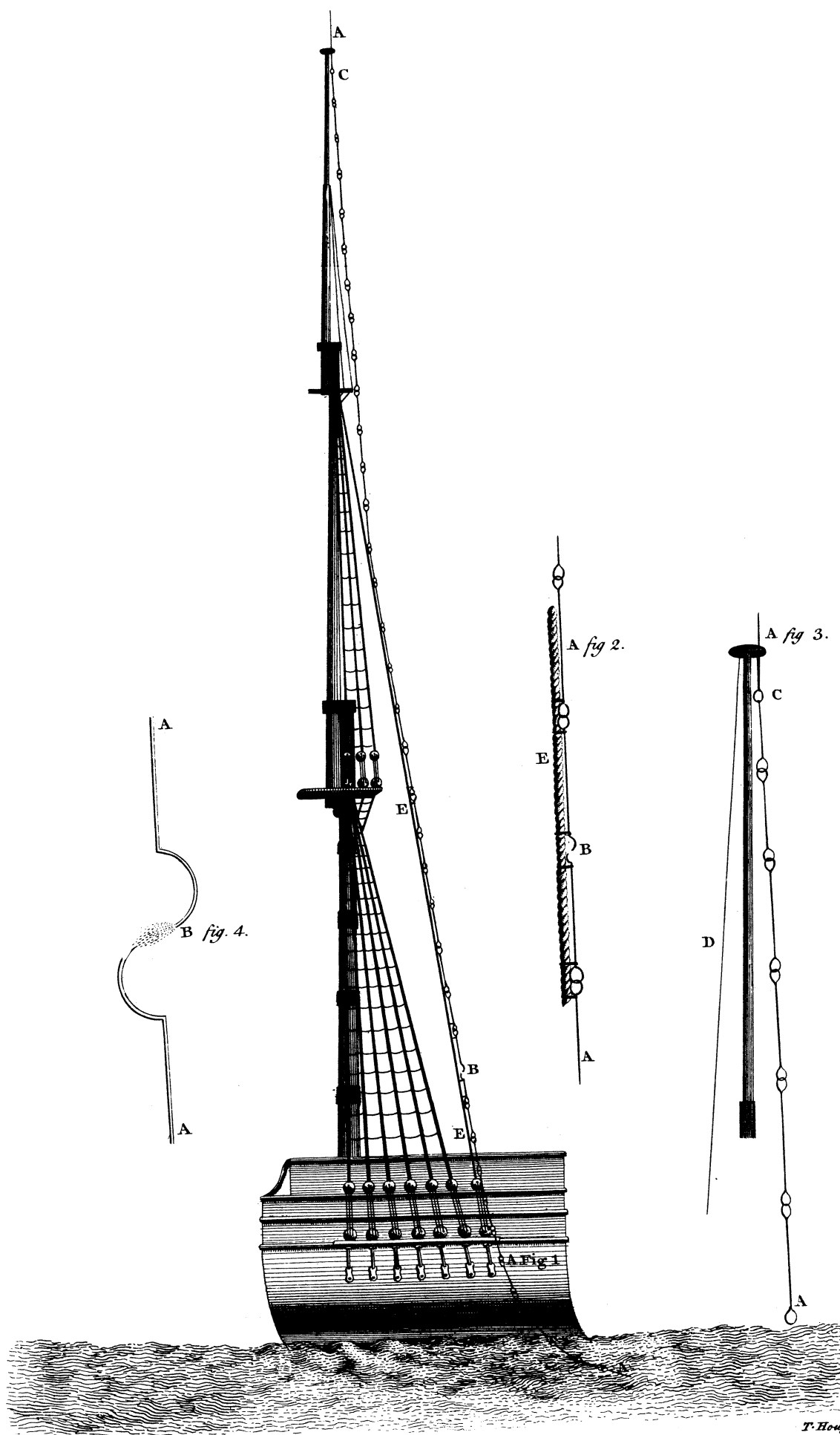


Received February 1, 1770,

XVII. *A Letter to Dr. Benjamin Franklin, F. R. S. giving an Account of the Appearance of Lightning on a Conductor fixed from the Summit of the Mainmast of a Ship, down to the Water : By Capt. J. L. Winn.*

S I R,

Read March 29, 1770. **I**T is a common, and, I am afraid, just complaint, that seamen are exceedingly backward in availing themselves of the discoveries which men of science have made, and the directions which they have given for their benefit and safety. Notwithstanding the pains several eminent philosophers have taken, to bring conductors into general use, as well in ships as houses; it is too true that very few vessels are furnished with them, though scarce a year passes, that does not afford us instances (some of them terrible ones), of ships being struck by lightening: for my part, I am never without a conductor in my ship. I have had them of various constructions: that which I now use, is a chain of copper wire, as described in the annexed plate. That such a chain, so disposed, may conduct the lightening, and prevent a stroke that might destroy a ship, has often been demonstrated; but a circumstance



stance that occurred in my last voyage, may perhaps have greater weight with some seamen, than all the reasonings of the electricians. If it should be a means of persuading them to make use of conductors, my intention will be answered.

In April last, as we approached the coast of America, we met with strong South-westerly gales: they had continued several days, when exceeding dark heavy clouds arose in the opposite quarter, forced against the wind that blew with us, till they had covered all the North-eastern half of the hemisphere: the struggle then between the two winds was very extraordinary; sometimes one prevailing, sometimes the other. I was apprehensive we should have much lightning, and got my conductor in order; when, in hauling up the mainsail, the sheet block struck violently against the back-stays, to which the chain was fastened (E E in fig. 1. TAB. VII.), and, as I found afterwards, broke the latter, which occasioned the phenomenon I am going to describe. It was near midnight and very dark, when I first observe a pale bluish light a few feet above the quarter rail: at first I thought it proceeded from the light in the binnacle; but, finding that it frequently disappeared and returned again precisely in the same place, and that it sometimes emitted sparks not unlike those of a small squib, I began to suspect that it proceeded from the conductor. To be certain, I ordered all the lights to be put out below, and, that no rays of light might issue from the binnacle, I covered it entirely with my cloak. I was presently confirmed in my conjecture, that the light and sparks which I had observed proceeded from the chain; for, placing myself near it, during the

the space of two hours and a half, I saw it frequently emit continued streams of rays or sparks (see fig. 4.); sometimes single drops as it were slowly succeeding to each other, and sometimes only a pale feeble light. On examining next morning, I found the chain broken at B, half the eye of each link being quite gone, and the points of the remaining halves about three fourths of an inch asunder : luckily, the chain was fastened to a smaller rope (fig. 2.) above and below the eye of each link, which prevented that part of the chain below B, from falling into the water, or of being separated from the part above B, beyond the striking or attracting distance.

I am with the greatest respect,

S I R,

Your obliged humble servant,

J. L. Winn.

References to PLATE VII.

- AAA The conductor, a chain of copper wire, of the thickness of the barrel of a small quill, the uppermost and lowest links of which terminate in fine points.
- B Fig. 1. The broken links; in passing between which, the lightning became visible.
- C An eye in the uppermost link, to which the pendant halliards are fastened.
- D Fig. 3. The pendant halliards, which pass over a sheave in the truck, on the top-gallant-mast-head, and are fastened to the eye at C, and hoist up the chain, till the point of the uppermost link is a foot or two above the truck.
- EE The maintop-mast backstay, to which the chain is stopped, to prevent its swinging about.
- B Fig. 4. Appearance of the lightning passing between the broken limbs.